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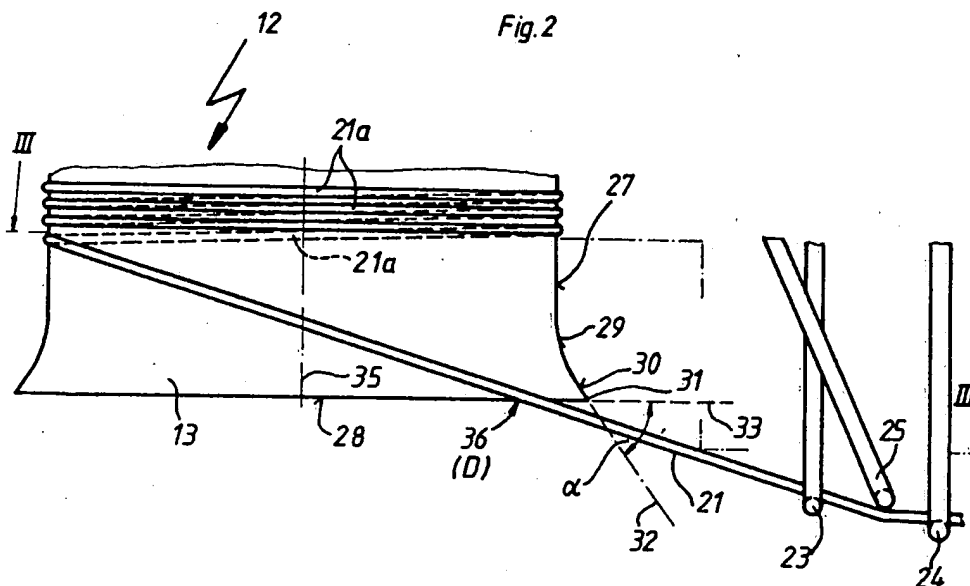
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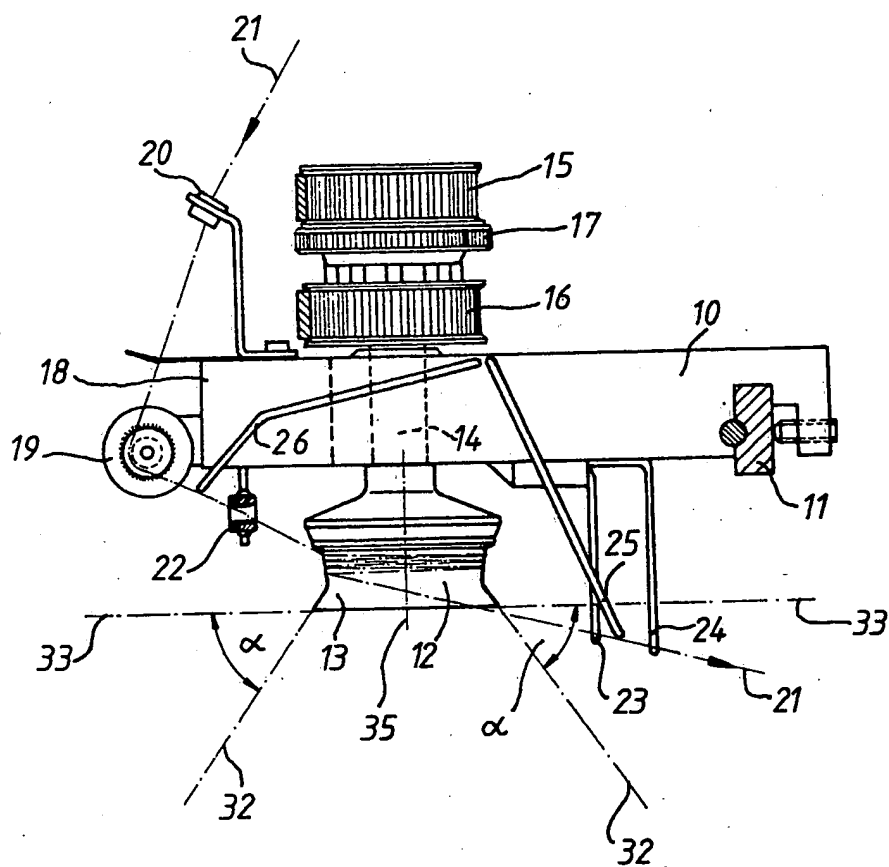
## (54) Thread delivery device

(57) In a thread delivery device for textile machinery, a driven thread storage drum (12) widens in its end region (13) continuously in step-free manner from a thread storage portion (17) to the largest outside diameter location (31) of the drawn-off side of the end region (13). A draw-off-side thread guidance member (23) is so arranged in a specific angular region ( $\alpha$ ) outside the thread storage drum (12) that upon thread draw-off, the thread (21) butts against the drum (12/13) from the thread storage portion (27) as far as the largest outside diameter location (31).



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Fig. 1



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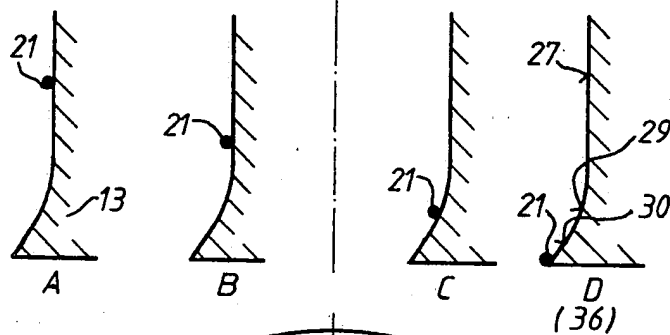
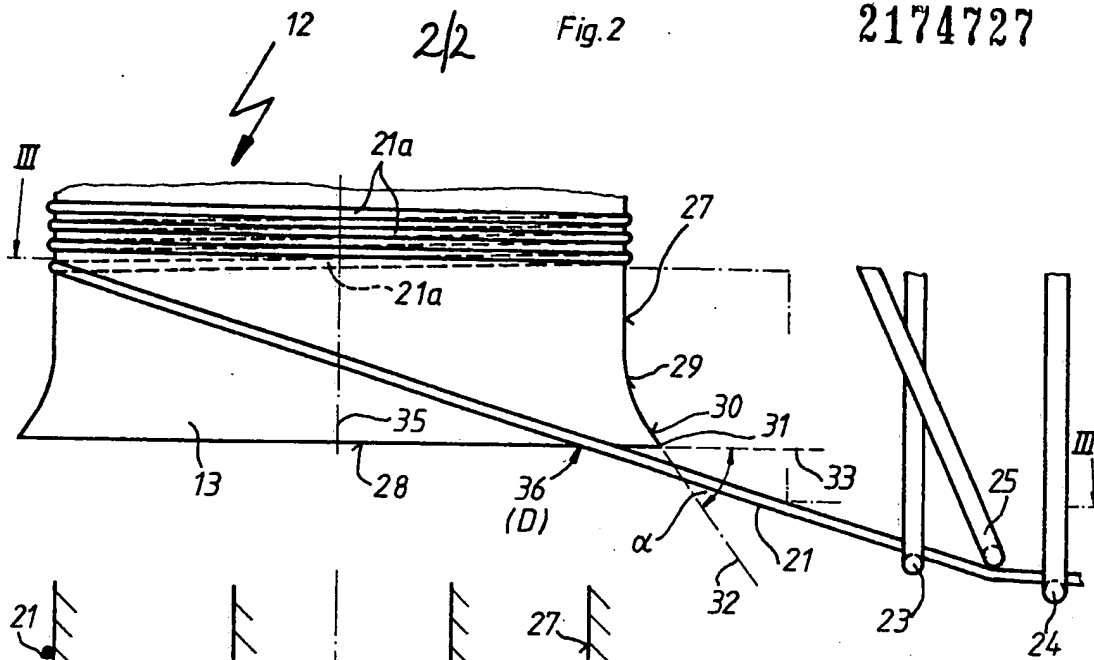


Fig. 4

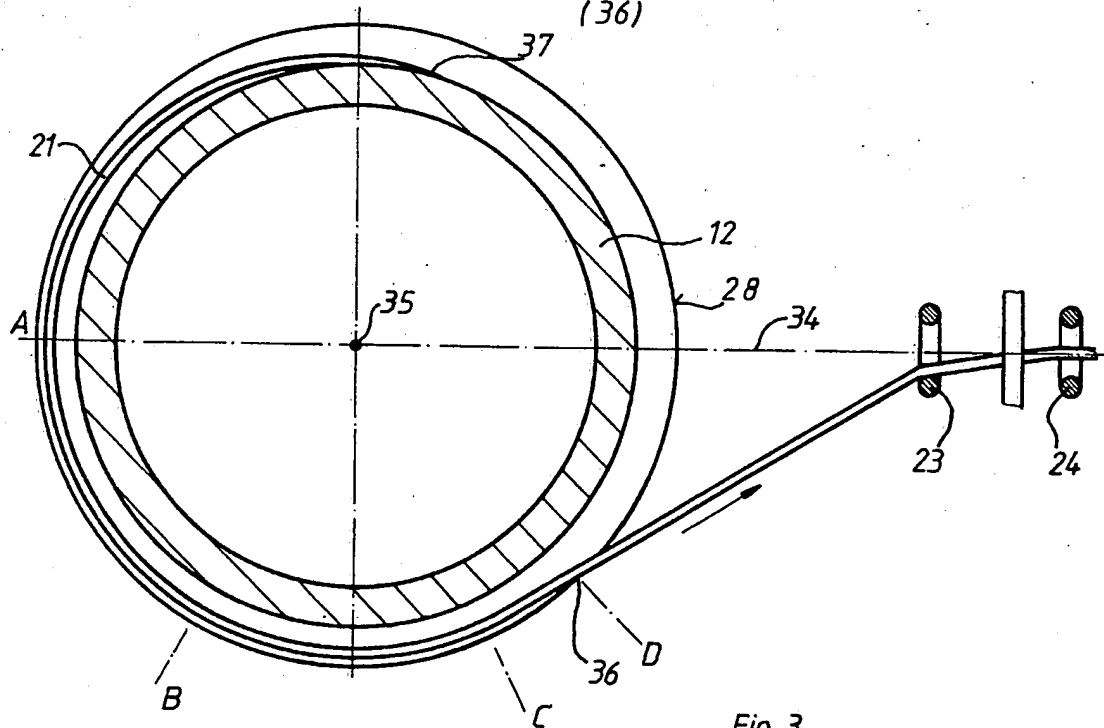


Fig. 3

## SPECIFICATION

## Thread delivery device

This invention relates to thread delivery devices for textile machinery, said devices comprising a rotatably-mounted and drivable rotationally-symmetrical thread storage drum which has, in its thread draw-off side end region, a diameter which is enlarged relative to its thread storage region, and thread guidance members on the thread run-in side and on the thread draw-off side of the storage drum.

A thread delivery device having the features mentioned at the beginning hereof is known from DE—PS 19 66 159 and DE—PS 27 43 749. In the case of the known thread storage drums of this kind, the thread is so drawn off that it contacts the thread draw-off side enlarged diameter region of the thread storage drum either in part or not at all. It has, however, been shown to be disadvantageous if on a thread storage drum, in the end region on the draw-off side, drum portions remain untouched by the drawn-off thread. This disadvantage emerges, however, in the case of all thread storage drums in which the thread is drawn off above the lower drum edge or which are provided at their lower end with an annular flange which is intended to prevent thread coils from falling off the thread storage drum, and in which a so-called overhead draw-off of the thread over this flange is effected.

In the case of thread delivery devices of the kind mentioned at the beginning hereof, the endeavour is to the effect of finding a contour for the thread storage drum which yields favourable conditions if possible for all threads which can come for processing on a textile machine. On textile machinery, however, threads are processed which, by reason of differing production material, such as for example cotton, wool, synthetic fibre material, of differing processing and finishing, for example, smooth threads, twisted yarns, rippled threads or yarns, elastic threads, can have very different properties, which make themselves noticeable also at the thread delivery devices. In this respect, the processing of yarns exhibiting severe fibre abrasion has turned out to be a great problem. This fibre abrasion can settle in the thread storage-drum regions in which no abutment of the thread against the upper surface of the thread storage drum is effected. Finishing preparations, for example winding oils or winding wax, can in this respect moreover form coatings on the drum surface. Abraded fibres can collect in these regions to form a rapidly growing fibre ring, into which the thread can work itself in the draw-off region and which can act like a rough braking ring and lead to the snapping of the thread. Added to the general problem of making the shape of a storage drum of a thread delivery device such that for every thread and every kind of yarn it is ensured that the thread on the thread storage drum is shifted in a single coil layer from a feed location to a draw-off location, without in so doing thread coils overlapping and endangering an orderly draw-off

of the thread from the storage drum, there is thus the additional problem of preventing abraded fibres from being able to settle and accumulate on the thread storage drum.

Therefore, the special problem underlying the invention is to design a thread delivery device in such a way that, even in the case of yarns having severe fibre abrasion, an undisturbed coil run-off from its thread storage drum is guaranteed and no deposits can form in the thread draw-off side end region of the storage drum.

The problem posed is solved by the present invention in that it provides a thread delivery device for textile machinery said device comprising a rotatably-mounted and drivable rotationally-symmetrical thread storage drum which has, in its thread draw-off side end region, a diameter which is enlarged relative to its thread storage region, and thread guidance members on the thread run-in side and on the thread draw-off side of the thread storage drum, characterised in that the diameter of the thread storage drum widens continuously in a step-free manner from its thread storage portion to the largest outside diameter location of the draw-off side storage-drum end region and the thread guidance member on the thread draw-off side is arranged in an angular region which emanates from the largest outside diameter location of the storage-drum end region on the thread draw-off side and which is bounded, on the one hand, by a plane extending perpendicularly to the drum through the largest outside diameter location on the thread draw-off side and, on the other hand, by a linear extension of the storage-drum generatrices or surface lines at that largest outside diameter location, in such a way that upon the thread draw-off the thread from the thread storage portion as far as the largest outside diameter location butts throughout against the thread storage drum.

Advantageously, the diameter of the thread storage drum from the thread storage region to the largest outside diameter location initially widens in a concavely curved manner and then widens conically. The thread guidance member on the thread draw-off side can advantageously be a thread guidance eyelet of known kind which is so arranged that its axis intersects the axis of rotation of the thread storage drum.

Due to the special design of the thread storage drum in its end region on the thread draw-off side and the arrangement of the thread guidance member on the draw-off side, there arises the advantage that threads and yarns of all possible kinds of material the finishes are compelled, upon the draw-off from the thread storage drum, to remain in contact with the surface of the thread storage drum until they leave the thread storage drum at the largest outside diameter location of the storage-drum end region on the draw-off side.

Thus, in the draw-off side end region of the thread storage drum, the surface of the thread storage drum as far as its largest outside diameter location is always subjected to a self-cleaning by the thread that is to be drawn off, in which respect the continuously abutting thread or the continuously

abutting yarn removes abraded finishings or fibres from the surface of the storage drum up to and beyond the largest outside diameter location of the storage-drum end region. Thus, the thread storage drum of the invention does not possess a pronounced annular flange at the draw-off-side drum edge. It has been shown, in the case of known thread storage drums, that, at the transition from the thread storage region to an edge flange of a thread storage drum, particularly favourably abraded thread and yarn fibres can settle and build up into a ring of dirt which endangers the drawn-off thread. The step-free diameter widening of the thread storage drum in the draw-off side end region along can, however, not guarantee the continuous abutment, material to the invention, of the thread against the thread storage drum surface.

Furthermore, the thread guidance member on the thread draw-off side has to be arranged in the said angular region, so that this continuous thread abutment is guaranteed and no lifting off, in parts, of the thread from the drum surface takes place, not even in the edge-region shortly prior to the lifting off of the thread from the thread storage drum.

The invention will be described further, by way of example, with reference to the accompanying drawings in which:—

Fig. 1 is a side view of a preferred embodiment of the thread delivery device of the invention as mounted on part of a textile machine;

Fig. 2 is an enlarged side view of the draw-off side end region of a thread storage drum of the thread delivery device shown in Fig. 1;

Fig. 3 is a cross-section along the line III—III in Fig. 2;

Fig. 4 is four radial part-sectional representations of the storage drum and of the drawn-off thread at the peripheral locations A, B, C and D indicated in Fig. 3.

The preferred thread delivery device shown in Fig. 1 comprises a housing 10 which is hollow and which is releasably fastened, at one end, to a mounting rail 11 of a textile machine. Arranged on the underside of the housing 10 is a thread storage drum 12, the draw-off side end region 13 of which, of interest here, will be described in more detail in conjunction with Figs. 2 to 4. The thread storage drum 12 is connected securely to a shaft 14 which extends vertically through the housing 10 and is mounted in the housing 10. Mounted on that part of the shaft 10 which projects beyond the upper side of the housing 10 are two toothed belt pulleys 15 and 16 which can be coupled selectively with the shaft 14 in known manner by means of an axially-displaceable coupling or clutch disc 17 which is arranged between the two toothed belt pulleys 15 and 16.

Arranged on frontally exposed end 18 of the housing 10 is a thread brake 19. Above the thread brake 19 there is disposed a first thread guidance eyelet 20, connected securely to the housing 10, for thread 21 that is to be drawn off from a supply spool (not shown). Arranged on the underside of the housing 10, in the thread passage direction in front of the thread storage drum 12, is a thread-feed guidance eyelet 22. In the thread draw-off direction

behind the thread storage drum 12 there are disposed at a spacing one behind the other two draw-off side thread guidance members 23 and 24, the arrangement of which will similarly be explained in yet more detail in conjunction with Figs. 2 to 4. Between the two draw-off side thread guidance members 23 and 24 there is disposed a yoke 25, butting against the drawn-off thread 21, of a known thread monitoring mechanism which is accommodated in the housing 10 and which also comprises a swingably-mounted feeler 26 which butts against the fed thread 21 in front of the thread guidance eyelet 22.

Fig. 2 shows only the draw-off side end region 13 of the thread storage drum 12. The storage drum 12 has, in its central part, an approximately circular-cylindrical thread storage portion 27 around which the thread 21 is conducted in several coils 21a which are to extend, if possible, at a spacing from one another. From the cylindrical thread storage region 27 the drum diameter is enlarged towards the lower drum edge 28 in a stepless manner, initially in a concavely curved portion 29 and then continuously in a conical end portion 30. In the case of the preferred embodiment shown, the location 31 of the largest outside diameter of the storage-drum end region 13 coincides with the lower edge 28 of the thread storage drum 12. An extension of the conical drum jacket end portion 30 beyond the largest outside diameter location 31 yields a drum-jacket extension plane 32 which is indicated in Figs. 1 and 2 and which forms, with plane 33 determined by the lower edge 28 of the thread storage drum 12, an angular region OC. Inside this angular region OC, the draw-off side thread guidance members 23 and 24, designed as thread guidance eyelets in the case of the preferred embodiment shown, are arranged at a spacing one behind the other and, as shown in Fig. 3, in such a way that their axis 34 (Fig. 3) intersects the axis of rotation 35 of the thread storage drum 12. The arrangement of the thread guidance member 23 on the draw-off side is, in adaptation to the curvature course of the jacket surface of the thread storage drum 12 in its draw-off side end region 13, so selected that the thread 21, on its draw-off side between the last or lowermost thread winding 21a and the location 36 of the lower edge 28 of the thread storage drum 12 at which the thread 21 leaves the thread storage drum 12, butts continuously against the portions 27, 29 and 30 of the jacket surface of the thread storage drum 12. The thread 21 thus has contact with the jacket surface of the thread storage drum 12 on its entire path, evident from the sectional view of Fig. 3, from the locations 37, shown in Fig. 3, as far as the location 36 where it leaves the thread storage drum 12.

In Fig. 3 are indicated four radial sectional locations A, B, C and D through the draw-off side storage-drum end region 13 which are shown in Fig. 4 and which show how, over the entire draw-off stretch as far as the edge location 36, the thread 21 is kept in abutment against the jacket surface of the thread storage drum 12 in the end region 13 thereof.

Linking to the location 31 of the largest outside diameter in the storage-drum end region 13 there

could also additionally be an inwardly curved drum portion, which is then not contacted by the thread 21. On such a linking drum portion, no fibre fuzz ring can form without it dropping off sooner or later from the storage drum 12. Deposits on such an inwardly directed adjoint-piece of the thread storage drum could also not hinder the drawn-off thread 21. The thread guidance members 23 and 24 do not have to be thread guidance eyelets, but could be open thread guidance hooks.

#### CLAIMS

1. A thread delivery device for textile machinery, said device comprising a rotatably-mounted and drivable rotationally-symmetrical thread storage drum which has, in its thread draw-off side end region, a diameter which is enlarged relative to its thread storage region, and thread guidance members on the thread run-in side and on the thread draw-off side of the thread storage drum, characterised in that the diameter of the thread storage drum widens continuously in a step-free manner from its thread storage portion to the largest outside diameter location of the draw-off side storage-drum end region and the thread guidance member on the thread draw-off side is arranged in an angular region which emanates from

the largest outside diameter location of the storage-drum end region on the thread draw-off side and which is bounded, on the one hand, by a plane extending perpendicularly to the drum through the largest outside diameter location on the thread draw-off side and, on the other hand, by a linear extension of the storage-drum generatrices or surface lines at that largest outside diameter location, in such a way that upon the thread draw-off the thread from the thread storage portion as far as the largest outside diameter location butts throughout against the thread storage drum.

2. A thread delivery device as claimed in claim 1, characterised in that the diameter of the thread storage drum from the thread storage portion to the largest outside diameter location initially widens in a concavely curved manner and then widens conically.

3. A thread delivery device as claimed in claim 1 or 2, characterised in that the thread guidance member on the thread draw-off side is a thread guidance eyelet of known kind, the axis of which intersects the axis of rotation of the thread storage drum.

4. A thread delivery device substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.